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CLAIMS

10 1 - Automatic personal weapon using caseless ammunitions characterized in that it comprises:

- a chamber sealing system using mechanical or gas pressure variation of the bore of segments or corollas,
- a cylinder head/barrel solidarisation device using spigots driven by gas,
- a cartridge ignition/ejection combined device with a function of extractor recall,
- 15 - an extractor automatic raising device,
- a magazine compartments sequencer device,
- a magazine cartridges placement device,
- a counter-trigger safety device,
- a quadruple effect key locking mechanism,
- 20 - a firing stabilization device using gas port at the chamber level,
- an ammunition power increase device using a telescopic barrel,
- an information routing device using a recuperator spring doubled by one or more conducting wires.

25 2 - Automatic personal weapon according to claim 1 characterized in that the mechanical device producing a variation of the bore of segments or corollas is composed with:

- a central sleeve (44), whose front face corresponds to the bottom of the cartridge basin, equipped with two conical shoulders or stages (45 & 45 bis) simultaneously ensuring the gas sealing and course abutment role of said sleeve, the second conical stage (45 bis) ensuring more particularly the role of drawer for the compression of spring pumps (47) or the displacement of balls (54 bis).
- 30 - a conical narrowing (fig.6/15 & 6/16, A) of the piston (62) chamber such that the chamber/piston machining allowance be lower or equal to that of maximum bore (fig.6/16, C) of a corolla (41 sept) when the piston reaches its course end,
- 35 - spring-pumps (47) arranged out of star around the axis of the chuck.
- a central sleeve (44) equipped with a stage (45 quart) seat for expansible disc(s) (46).
- one or more conical expansible discs (46).

40 3 - Automatic personal weapon according to claim 1 characterized in that the device for variation by gas pressure of the bore of segments or corollas comprises:

- a circular groove (42 bis) to uniformly distribute the gas pressure, concentric with the housing (42) of a segment (41, 41 bis, 41 ter, 41 sept) or couple of segments (41 quart & quint).
- channels (40) bored through the chuck body with an appreciably radial direction and emerging in the circular groove (42 bis) concentric to the housing (42) of the ring seal and/or the housing for spigots (fig.6 bis) and communicating with channels (39) parallel to the central axis and emerging in the sole cartridge basin.
- 45 - grooves (40 bis) in a variable number symmetrically distributed at the periphery of the piston head and ensuring gas tapping at the front face level of said piston in order to forward them to the circulation groove (42 bis) with which they communicate,
- 50 - a cartridge basin comprising radial lights (channels) or crenels (40 ter), symmetrically distributed at the periphery and ensuring the communication between the interior of the basin and the circumferential housing (42) groove of a sealing segment (or couple of segments) located around the piston at the level of said basin.

- 5 4 - Automatic personal weapon according to claims 1, 2 and 3 characterized in that the segments (41, 41 bis, 41 ter, 41 quart, 41 quint, 41 six) are retracted in rest position inside their housing groove (42) in such way that their external diameter remain lower than the bore or diameter of the piston.
- 5 - Automatic personal weapon according to claims 1, 2 and 3 characterized in that the sealing corollas (41 sept, oct, nove & eleven) are rotulant and closed and that:
- 10 - the thickness of the section decreases regularly, according to a generating line preferentially but not exclusively curve, ranging between the base (B) and the upper edge (O) in order to favor, under gas pressure or a narrowing of the chamber (62), a combined elastic radial variation of the curve with a torsion of the complete section (fig. 6/17) which swivels around the round interior edge (fig. 6/15, B) of its base,
- 15 - the external face comprises an angular sector (fig.6/15), on both sides of the point (C) of greater bore, whose radius is advantageously close to that of the chamber in order to favor a peripheral sealing contact of the rotulant type,
- the external face can comprise a crown (41 ten) whose opening is opposed to that of the corolla (41 nove) and such that the bore at rest of its larger diameter point (D) is superior to that of the arrow (C) of said corolla and to that of a contracting of the piston chamber (62),
- 20 - the internal edge (fig. 6/15, B) of the base section is preferentially circular in order to ensure a rotulant sealing contact via a valve effect between the walls (fig.6/16 & 6/18, 42 quint & 42 six) of its housing groove (42),
- the base of the corolla (41 eleven) is integrated into the lower part (17) or chuck of the piston forming a
- 25 - the bore, at rest, of the upper external edge (fig. 6/17, point O) is at most equal to that of the piston.
- 6 - Automatic personal weapon according to claims 1, 2 and 3 characterized in that the segment, couple of segments or corolla (41, 41 bis, 41 ter, 41 quart, 41 quint, 41 six, 41 sept, 41 oct, 41 nove, 41 eleven) is assembled:
- 30 - on the heads of spring pumps (47), placed out of star around the axis of the piston, said pumps sitting on a conical stage (45 bis) of the central sleeve whose displacement, under the action of propellant gases, causes a radial pressure on said spring pumps which compress and cause the uniform diameter increase of the segment by plating it against the wall of the piston cylinder (62) thus ensuring the gas sealing.
- on balls (54) or spigots disposed all around the sleeve (44) in the segment housing groove, so as to be simultaneously in contact with the internal face of said segment and a conical stage (45 bis) of the sleeve
- 35 whose displacement causes the radial extension involving the uniform diameter increase of the ring seal by plating it against the wall of the piston cylinder (62) thus ensuring the gas sealing.
- around an expansible disc (46) sitting on a stage of the central sleeve whose displacement, under the action of propellant gases, causes the compression of said disc involving its uniform diameter increase and that the ring seal (41) by plating it against the wall of the piston cylinder housing (62) thus ensuring the gas
- 40 sealing.
- around a circular groove (42 bis), concentric with the seat groove (42), intended to uniformly distribute the action of propellant gases on the internal face of the segment (41, 41 bis, 41 ter, 41 quart & quint, 41 sept) causing its uniform diameter increase by plating it against the cylinder wall (62) of the piston chamber ensuring thus the gas sealing.
- 45 - in front of radial lights or crenels (40 ter) arranged on the periphery of the cartridge basin so as to uniformly distribute the action of propellant gases on the internal face of the segment, couple of segments (41, 41 bis, 41 ter, 41 quart & quint, 41 sept) or corollas (41 sept, nove & eleven) causing a uniform diameter increase and a contact with the cylinder wall (62) of piston housing ensuring thus the gas sealing.

- 5 - such that, in the case of two segments (41 quart, 41 quint) with a profile preferentially but not exclusively out of square or L shaped, concentric and indexed at 180°, the short branch (drawing 7/27, fig. 6/12 to 6/14) of their section penetrates in a circumferential groove dug at the bottom and on level of the lower edge of their housing groove (42) forming a shoulder (42 quint) so that when the piston recoils, under the friction effects of the external segment (41 quint) on the chamber wall, the short branch of the L section of the internal segment (41 quarter) abuts against the shoulder (42 quint) forming thus a sealing and preventing any gas leakage circulating behind the segments. The internal segment (41 quarter) preferentially comprises a bayonet opening on the short branch of its section such that its opening (h) be shorter than the opening of said segment once dilated on the shoulder (42 quint). The external segment (41 quint) comprises a bayonet opening on its two branches so that a perfect sealing be ensured by the couple of segments independently of the friction effects tending to lift it up or the gas pressure tending to plate it on the lower face of the receiving groove.
- 10 - such that, in the case of a closed annular segment (41six), the sides of the trapezoidal/triangular isosceles section are resting against the symmetrically arranged faces on the sleeve head (44) and chuck (17) at the level of the groove (42) housing in order to produce an expansion of said segment when an effort is applied to the piston head.
- 15 - the opening directed towards the piston head in the case of corollas (fig.6/16 & 6/18, 41 sept & 41 nove) with some lateral and axial play in a housing (42) of said piston comprising at the level of its lower edge a receiving groove (42 quart) for the corolla base or foot in order to facilitate the angular torsion displacement of the section and the rotulant contact of the internal rounded edge (fig.6/15) of said base playing between the lower shoulder (42 six) of the groove (42 quart) and its upper conical shoulder (42 quint) according to whether gas pressure pushes the corolla towards the bottom of the piston or friction against the chamber wall tends to lift it up.
- 20 - upside-down (41 oct.) with the sealing corolla (41 sept) in order to constitute a scraping corolla such that the arrow of convexity of the generating line be in contact with the edge of the chamber entry as soon as the cylinder head is fully closed.
- 25 7 - Automatic personal weapon according to claim 1 characterized in that the barrel/breech solidarisation device be composed of:
- 30 - radially laid out spigots housing (56), communicating with channels (39, 40) emerging in the cartridge basin, which ensure, under the pressure of propellant gases, the displacement of said spigots (54 & 55) according to an outwards radial direction outside the skirt, said skirt having a conical housing limiting the course of each tenon thus operating a tight connection of the valve type,
- 35 - spigots (54, 55).
- 8 - Automatic personal weapon according to claims 1 & 7 characterized in that the piston chamber (62) comprises females housings for the heads of piston spigots in front of which they are directly located.
- 40 9 - Automatic personal weapon according to claim 1 characterized in that the breech/barrel solidarisation device be composed of radially laid out tenon housings (56 bis) in the barrel internal wall at the level of the ammunition chamber in which they emerge directly and ensure, under the pressure of propellant gases, the displacement of spigots (54 & 55) that they contain according to an outwards radial direction.
- 45 10 - Automatic personal weapon according to claims 1 & 9 characterized in that the cylinder head (16) comprises female housings (56 ter) for barrel spigots in front of which they are directly located and said spigots (54, 55) preferentially adopt a sphere shape or present a flattened base topped by a cone finished by a half-sphere.
- 11 - Automatic personal weapon according to claim 1 characterized in that the combined device for igniting/ejection of cartridge (27, 28, 29 & 30) consists of an axial valve stem coupled to an extension (30, 38) striking during the aft movement of the cylinder head an abutment (77) integral with the frame.
- 50 12 - Automatic personal weapon according to claim 1 characterized in that the extractor foot return device (22) be articulated at the sleeve level and said foot assembled resting against the conical valve shape part of the igniter/ejector (27) so that the return spring of said igniter also provides the recall function for said extractor.

- 5 13 - Automatic personal weapon according to claim 1 characterized in that the automatic device for raising the extractor comprises a claw (21) which presents a hook shaped head whose front face is bevelled in order to cooperate with the raising slope (59) of the cartridge chamber and that the length of the main extractor arm is adapted to ensure the engagement of the raising slope before the head of cartridge butts against the entry of barrel during the breech closure.
- 10 14 - Automatic personal weapon according to claims 1 & 13 characterized in that the housing for rising the extractor claw is composed of a tilted slope (59) located at the entry of the ammunition chamber and in the axis of said extractor claw with which it cooperates.
- 15 15 - Automatic personal weapon according to claim 1 characterized in that the trigger safety (68) or "counter-trigger" is composed of:
- 15 - an operating (68) bar or counter-trigger lever integral with the trigger guard bolt and retractable in a housing (69) of said trigger guard,
- a trigger locking device manoeuvred by angular rotation of the trigger (64) following a pressure exerted on its back face.
- 20 16 - Automatic personal weapon according to claim 15 characterized in that the trigger locking device is composed of a female housing (67) receiving the warp end (66 bis) of the trigger guard bolt and a circular cam (67 bis) over a portion of angle corresponding to the backwards clearance (shooting) of the trigger, cam on which the warp end is pressing under the action of the return spring of the bolt and said housing (67) positioned in such way that its engagement by the warp end is only possible after the trigger carried out an anti-clockwise rotation suitable to erase a setback (67 ter) involving an embossing effect by slight retreat of the warp end right before it engages its trigger housing (67).
- 25 17 - Automatic personal weapon according to claim 1 characterized in that the magazine compartments coupling/sequencer device is composed of a cartridge arm stopper (103) comprising at its end a horizontal abutment (103 bis), articulated on the back wall of the magazine well with which it is integral via an axis crossing the frame:
- 30 - either in a parallel way to the barrel axis in order to ensure a lateral swivelling of the stopper-arm (103) and its horizontal abutment (103 bis) initiated by the rise of the front conveyer button (101) who, as soon as the last cartridge leaves the compartment, causes the swing of a transmitting rod housed in the internal side wall of the magazine well and mounted swivelling on its median axis to cooperate with an arm integral to that (103) of the cartridge stopper to involve its lateral swing.
- 35 - either in a perpendicular way to the barrel axis in order to ensure a backwards swivelling of the stopper which then comprises an locking-arm (103 ter) equipped at its end with a pin (102 bis) to co-operate with a locking hook (102).
- 18 - Automatic personal weapon according to claim 17 characterized in that the stopper hook (102) comprises a cam (102 ter) cooperating with the conveyer button (101) of the front compartment in order to cause its swivelling.
- 40 19 - Automatic personal weapon according to claim 1 characterized in that the cartridges placement device in the magazine (95) be composed of a rectilinear profile of said magazine from the base up to a certain height where its lateral faces adopt a particular slope angle forming a narrowing at the top such that the angle of slope (or slope) of a side face is different from that of the other face.
- 45 20 - Automatic personal weapon according to claim 1 characterized in that the barrel rise compensator unit for the shooting of caseless ammunitions be composed of a vertical gas port (90), bored through the upper wall of the barrel at the cartridge chamber entry, communicating:
- either with an assembled side-mounted tube emerging at the top end,
- either with a longitudinally bored channel (fig.10, n°92) in the slide wall alongside the barrel and emerging at its end according to an upwards direction. The slide opening adopts the shape of a groove (91) practiced on its internal face with a favourable length to support the gas supply during the back travel of the breech.
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- 5 21 - Automatic personal weapon according to claim 1 characterized in that the key locking mechanism of the weapon is composed of a housing (113) for a removable locker (114) and a locking stem (115) for the magazine well, said housing located on the lower face of the frame in front of the trigger guard and the aforementioned locker crossing the frame to emerge under the barrel in order to limit the breech travel to the sole distance ranging between the locker head of and the front lower edge of the breech.
- 10 22 - Automatic personal weapon according to claim 21 characterized in that the magazine well locking stem (115) has an emerging end in said well and the other end comprises a warp end (115 bis) involving the displacement of said stem during the engagement of the locker body in its housing (113) in which it emerges.
- 15 23 - Automatic personal weapon according to claim 1 characterized in that the device to increase the power of the ammunition is composed of a telescopic barrel (138) with automatic extension mounted sliding inside a second barrel (140) and maintained into retracted position by a return spring (141). The internal barrel (138) presents the shape of a hollow roll whose internal diameter is adapted to the caliber of the ammunition and comprises two contiguous and coaxial sections (138 bis) and (138 ter) with external diameters ready to cooperate respectively with the diameters of the interior shoulders (140 bis and 140 ter) of the external barrel (140) inside which said internal barrel slides.
- 20 24 - Automatic personal weapon according to claim 23 characterized in that the telescopic gun (138) comprises on its lower diameter (138 ter) part a certain number of rectilinear or helicoidal grooves cooperating with symmetrically arranged grooves on the internal face of the cylindrical part of lower diameter (140 bis) of the external barrel with which it cooperates.
- 25 25 - Automatic personal weapon according to claim 1 characterized in that the recuperator spring (57) is doubled by one or more conducting wire contained in a sheath surrounding said wire indexed at its two ends, namely the barrel bedding and the breech, in order to ensure a tight multipolar connection between the information routing wire from the trigger (125 quarter) and the central processing unit of the breech (125 ter).
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